BEFORE THE

Federal Communications Commission

WASHINGTON, DC 20554

In the Matter of	)	
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Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz	)	ET Docket No. 10-142

To: Secretary, Federal Communications Commission
Attn: The Commission

CONSOLIDATED REPLY TO OPPOSITIONS

The U.S. GPS Industry Council (the "Council"), by its attorneys and pursuant to Section 1.429(g) of the Commission's Rules (47 C.F.R. § 1.429(g)), hereby replies to Oppositions filed by LightSquared Subsidiary LLC ("LightSquared") and Sprint Nextel Corporation ("Sprint Nextel") in response to the Council's Petition for Reconsideration, filed June 30, 2011 in the above-captioned proceeding.[1] LightSquared's Opposition is flawed, and unreasonably distorts the Commission's precedent. The Commission's precedent is perfectly clear; at no time prior to late 2010 was the Commission asked to consider ubiquitous deployment of Mobile-Satellite Service ("MSS") Ancillary Terrestrial Component ("ATC") terminals providing terrestrial-only service.[2] In its review of the issue, including its most recent rulemaking on MSS ATC in 2005, the FCC has unequivocally established ATC as, at best, an unallocated spectrum use subordinate to the MSS, and it affirmatively required MSS ATC licensees to protect *all other services*, particularly

[1] *Fixed and Mobile Services in the Mobile-Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, 26 FCC Rcd 5710 (2011) ("*2 GHz MSS R&O*").

[2] To the extent that it does not simply piggy-back on LightSquared's assertions, Sprint Nextel's Opposition seeks to analogize unrelated spectrum sharing situations between co-equal services that are inapposite to the primary use of the L-band by GPS receivers and ATC uses which are non-protected and must be conducted on a non-harmful interference basis.

GPS operations in the adjacent radionavigation-satellite service ("RNSS") band, against harmful interference from ATC operations.

I. The Commission Has Consistently Affirmed the Subordinate Status of Ancillary Terrestrial Component Services by MSS Providers.

In its Opposition, LightSquared continues its attempt to alter perceptions of the FCC's consistently applied MSS ATC rules by taking out of context a handful of isolated statements, both from the Commission and the Council, and distorting their import to suit its current business aspirations. In particular, it cites the Commission's decisions in the *2005 MSS ATC Reconsideration Order* declining either to require "satellite-first routing" in the MSS bands or to limit the number of MSS ATC base stations as somehow establishing Commission intent that MSS ATC licensees have the unfettered ability to develop and deploy widespread terrestrial mobile services.[3] LightSquared is wrong. The FCC declined to adopt specific requirements in these areas not because it saw unbounded potential for terrestrial mobile service deployment, but because it saw rigid operational limitations as both arbitrary in effect and inherently unnecessary given the manifestly limited nature of the MSS ATC service.

The Commission made plain in 2005 that it saw ubiquitous deployment of terrestrial-only MSS ATC not as inevitable, as LightSquared now seeks to portray it, but as unthinkable. For example, the Commission noted its agreement with Boeing's statement that "MSS operators will invest in the additional cost of ATC transmitters only where the MSS signal is not available or in heavily populated 'bottleneck' locations."[4] Drawing on this and other views advanced in the proceeding, the Commission affirmatively found "no basis in the record to conclude that MSS/ATC operators would surrender their single most valuable system feature, complete

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[3] *See* LightSquared Opposition at 3-5, *citing Flexibility for Delivery of Communications by Mobile-Satellite Service Providers*, 20 FCC Rcd 4616, 4624-4626 (¶¶ 20-27) (2005) ("*2005 MSS ATC Reconsideration Order*"). *See also* Sprint Nextel Opposition at 7-8.

[4] *2005 MSS ATC Reconsideration Order* at 4625 (¶ 22) & n.66.

ubiquity of coverage, in order to compete with the already well developed and heavily financed terrestrial mobile systems."[5] Later in the same order, the Commission stated that:

> In any channel that is coordinated for the exclusive use of an MSS/ATC operator, and where there is no other MSS operator's satellite within the visible arc as seen from the ATC geographic coverage area, the MSS/ATC operator is limited only by in-band and out-of-band emission limits ***and the need to control self-interference sufficiently to maintain satellite service***.[6]

This paragraph shows that the Commission specifically contemplated that MSS/ATC operators would continue to be required to control self-interference to a level that enabled them to maintain ubiquitous satellite service. The FCC relied upon the limit on overall interference as the basis for eliminating the original cap on the number of ATC base stations, stating that "our overall limit on the interference an MSS/ATC operator may cause to other MSS systems obviates the need for a numerical limit on ATC base stations."[7] The removal of the limit on the number of base stations was thus intended merely to enhance licensee flexibility not to expand the scope of terrestrial deployment, which was affirmatively limited by other regulatory requirements.[8] Accordingly, the *2005 MSS ATC Reconsideration Order* provides no basis at all for the notion that widespread terrestrial deployment was expected to occur in the MSS L-band; to the contrary, it shows conclusively that such claims are baseless.

Similarly, LightSquared seeks to misconstrue a 2003 Council statement with respect to "potentially" large numbers of MSS mobile terminals operating in ATC mode[9] in an effort to

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[5] *2005 MSS ATC Reconsideration Order* at 4625 (¶ 23).

[6] *2005 MSS ATC Reconsideration Order* at 4633 (¶ 46) (emphasis added).

[7] *2005 MSS ATC Reconsideration Order* at 4634 (¶ 48).

[8] With the integration requirement waived, separate terrestrial components permitted, and an unlimited number of base stations possible, LightSquared's ability to maintain satellite service would be lost in any area served by the terrestrial component and the premise of power levels adopted in the *2005 MSS ATC Reconsideration Order*, upon which LightSquared has so heavily relied, would be abrogated.

[9] *See* LightSquared Opposition at 4-5, *citing* Reply Comments of USGIC, IB Dkt. No. 01-185, at 2 (Sept. 4, 2003)

portray the GPS industry as having long known that high-density, high-powered ubiquitous terrestrial mobile transceiver deployment was likely in the band. In fact, the Council's statement was made in the context of seeking approval for jointly-agreed operating limits for MSS ATC service premised on ATC gap filler base stations located on buildings, garages, cell towers and other urban structures where the MSS signal was attenuated or otherwise obstructed. Just like the Commission, the Council understood that the MSS ATC gating requirements would preclude widespread simultaneous terrestrial-only ATC operation, even if there might be many handsets with such capability, and that the power of those transmissions would need to be limited so as to achieve compatibility with co-frequency MSS. Like the Commission, at no point prior to last year's LightSquared modification application seeking removal of the gating criteria did the Council consider the prospect of a ubiquitous, high-power terrestrial service that would actually *preclude* co-coverage MSS. Indeed, in last year's National Broadband Plan, the Commission reiterated its determination that ATC was intended only "to enhance coverage in areas where the satellite signal is attenuated or unavailable," and emphasized the role of the gating criteria in ensuring that ATC "remains ancillary to the principal MSS offering."[10]

II. MSS ATC Services Must Not Interfere with Reception of GPS Signals.

Notably, while attempting to twist the meaning of the Council's statements in the manner outlined above, LightSquared simultaneously ignores its own predecessor licensee's explicit acknowledgment in the very same context of "the need to protect GPS receivers from the aggregation of interference from multiple sources."[11] LightSquared instead endeavors to eviscerate the meaning of the Commission's interference protection requirements by inferring

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[10] *Connecting America: The National Broadband Plan* at 87 (April 2010).

[11] *See* Letter from Bruce D. Jacobs, Counsel to Mobile Satellite Ventures, L.P., and Raul R. Rodriguez, Counsel for the U.S. GPS Industry Council, to Marlene H. Dortch, Secretary, FCC, IB Dkt. No. 01-185, at 1 (dated July 17, 2002).

unwritten exceptions to the FCC's Rules exempting the overload interference it would cause to GPS receivers, and advancing the novel claim that it is acceptable for services operating on a strictly non-harmful interference/non-protected basis to interfere with satellite networks operating on a primary basis in accordance with the table of frequency allocations. LightSquared's claims are contrary to the nature of spectrum allocations, and none of them withstands serious scrutiny.[12]

A. Section 25.255 Makes Plain that Any MSS ATC Provider Must Resolve Harmful Interference Caused to "Other Services."

Section 25.255 of the FCC's Rules states plainly and unequivocally that "[i]f harmful interference is caused to other services by ancillary MSS ATC operations, either from ATC base stations or mobile terminals, the MSS ATC operator must resolve any such interference."[13] LightSquared attempts to absolve itself of compliance with these straightforward requirements based on groundless assertions, in which Sprint Nextel joins, that GPS is excluded from the scope of "other services," GPS receivers are not within the scope of any protection, and/or harmful interference should be redefined to suit LightSquared's current purposes.

LightSquared maintains that Section 25.255 does not protect GPS because "GPS receivers are not part of a service authorized by the Commission."[14] In making this unfounded claim, LightSquared appears to misconstrue the Commission's reference to "authorized services" in a post-adoption description of the rule as limiting such protection to users and equipment actually

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[12] Sprint Nextel's efforts to analogize the circumstances here to those involving spectrum sharing between co-primary wireless and public safety users in the 800 MHz band are misplaced. *See* Sprint Nextel Opposition at 2-4. Co-primary service operators must cooperate to ensure that both can co-exist in a band allocated to two or more services on a co-equal basis. MSS ATC in the L-Band is not co-primary to any other service; indeed, it has no allocation status at all.

[13] 47 C.F.R. § 25.255.

[14] LightSquared Opposition at 8.

licensed by the FCC.[15] The rule itself, however, refers only to "other services," and in no respect does the Commission purport to limit the scope of the interference protection only to its own ***licensees***. GPS end users are availing themselves of services provided for their use in spectrum allocated to RNSS, which is specifically defined in the Commission's rules[16] and operates on a primary basis subject to the FCC's Table of Allocations.[17] Indeed, in the same *2008 Big LEO MSS ATC R&*O that LightSquared cites (see footnote 15), the Commission stated that Section 25.255 imposes "an absolute obligation on the MSS/ATC operator to resolve any harmful interference to other services," and went on to state in response to concerns raised by Sprint Nextel with respect to interference to BRS base station receivers that "receiver overload interference … is among the problems that ATC must take into account in avoiding harmful interference to other services."[18] Thus the GPS implementation of RNSS is unquestionably an "other service" and GPS receiver overload is plainly "harmful interference" under Section 25.255.

Sprint Nextel is likewise incorrect in its assertion that Section 25.255 "should be fairly read to apply only to interference concerns between systems operating in the same band."[19] There is nothing fair or accurate in such a reading of the rule, which was specifically adopted to protect services operating in adjacent frequency bands. LightSquared is the only U.S. licensee in the only service allocated in the 1525-1559 MHz band within the United States. The rule does not refer to other "systems." If the provisions of 25.255 have any meaning, they must be read to protect

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[15] *See* LightSquared Opposition at 8 & n.24, *citing Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2/4 GHz Big LEO Bands, and Globalstar License LLC*, 23 FCC Rcd 7210, 7222 (¶ 32) (2008)("*2008 Big LEO MSS ATC R&O*").

[16] *See* 47 C.F.R. § 2.1 (*Radionavigation-Satellite Service*. A radiodetermination-satellite service used for the purpose of radionavigation. This service may also include feeder links necessary for its operation.)

[17] *See* 47 C.F.R. § 2.106 (Table of Allocations) (RNSS and Aeronautical Radionavigation identified as co-primary services in the 1559-1610 MHz band).

[18] *2008 Big LEO MSS ATC R&O*, 23 FCC Rcd 7223 (¶ 35) & n.118 and 7224 (¶ 36) & n.119.

[19] Sprint Nextel Opposition at 7.

"other services" in other bands.[20] As demonstrated in the Council's Petition, the purpose of the interference protection rules with respect to GPS, a key basis for the adoption of Section 25.255, was from the outset the protection of adjacent-band GPS receivers from harmful interference.[21]

While LightSquared is correct on the surface that "there was no reason to consider" specific limits relating to GPS receiver overload when the rule was adopted,[22] this was so because such limits were not necessary in light of the fact that MSS ATC, as conceived by both the FCC and its proponents and because of the necessity to avoid harmful self-interference, was not intended to operate on a high-density basis with the high terrestrial service power levels LightSquared now seeks to employ.

B. Allocation of Spectrum to a Radio Service Protects Both Transmission And Reception of Signals Within That Service.

LightSquared also attempts to defend the Commission's pronouncement in paragraph 28 of the *2 GHz MSS Order* that it might be appropriate to establish "receiver standards relative to the ability to reject interference from signals outside their allocated spectrum."[23] Yet the FCC's

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[20] In establishing harmful interference to GPS receivers, only models that are appropriate to navigation signal accuracy requirements may be used. Sprint Nextel's efforts to redefine harmful interference for navigation services are no more legitimate than LightSquared's own efforts in this regard. *See* Sprint Opposition at 5 and LightSquared Reply Comments, IB Dkt. No. 11-109, at 30-33. Communications services and navigation services have different signal accuracy requirements and therefore employ different propagation models for evaluating interference. For communications systems, where uninterrupted connectivity is desirable but not critical, designers take into account many factors that may attenuate an interfering signal, thereby maximizing predicted service availability. In contrast, the user of a high-integrity navigation system that must achieve maximum accuracy and availability at all times must assume the highest power interfering signal with the least attenuation. Navigation system interference models therefore employ only free-space propagation. Actual measurements have shown, however, that interference from reflected signals (multi-path) frequently exceeds what is predicted even using a free-space model. Free-space propagation, while still undercounting actual interference, is thus the only appropriate model for assessing the prospect of harmful interference to radionavigation systems.

[21] *See* Council Petition for Reconsideration at 7, *citing Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band*, Notice of Proposed Rulemaking, 16 FCC Rcd 15532, 15559 (¶ 68) (2001) ("The L-band MSS satellite transmitters operate [in] the lower adjacent band to the Global Positioning System ("GPS") and other Radio Navigation Satellite Services. ***Unwanted emissions from terrestrial stations in the MSS will have to be carefully controlled in order to avoid interfering with GPS receivers***.") (emphases added).

[22] LightSquared Opposition at 11.

2005 MSS ATC Reconsideration Order makes plain that the Commission endorsed the opposite approach, permitting manufacturers and service providers the freedom to design receivers based on the spectrum environment mandated by the FCC's allocation tables and service rules.[24] It goes without saying that when manufacturers and service providers make decisions regarding receiver design, they do so in reliance on established FCC service rules and spectrum allocations. The implication of paragraph 28 that spectrum users offering primary service should be required to alter their operations to accommodate new uses in other bands operating outside the scope of the allocation table is simply inconsistent with the Commission's Rules and precedent and with its commitment not to second-guess receiver design decisions. It is also contrary, with respect to GPS in particular, to the national policy to sustain the radiofrequency environment in which GPS operates, which is a cornerstone of President Obama's 2010 National Space Policy.[25]

In addition, LightSquared erroneously maintains that because individual GPS receivers are unlicensed devices, they are not entitled to interference protection when accessing GPS transmissions.[26] Statements pursuant to the Commission's Part 15 equipment licensing rules regarding interference acceptance by unlicensed devices, however, do not alter the relative

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[23] LightSquared Opposition at 6-7; *2 GHz MSS R&O,* 26 FCC Rcd at 5723 (¶ 28).

[24] *See 2005 MSS ATC Reconsideration Order*, 20 FCC Rcd at 4636 (¶ 56) ("Generally, we do not regulate the susceptibility of receivers to interference from transmissions on nearby frequencies. Rather, we rely on the marketplace – manufacturers and service providers – to decide how much susceptibility to interference will be acceptable to consumers,)

[25] *See National Space Policy of the United States of America* at 9 (June 28, 2010) ("The United States Government shall … take necessary measures to sustain the radiofrequency environment in which critical U.S. space systems [such as GPS] operate"). In the three decades since GPS became available on a commercial basis, its use has become ubiquitous throughout all economic sectors, and its availability has become the foundation of virtually all public safety operations. *See, e.g.*, Comments and Reply Comments of the Council, Garmin International, Trimble Navigation, and Deere & Company, all filed in IB Docket No. 11-109 (August 1, 2011 and August 15, 2011, respectively).

[26] *See* LightSquared Opposition at 9-10.

priority of primary, secondary and unprotected services.[27] GPS receivers are not unprotected Part 15 devices, like cordless phones or DVD players, but receive-only Earth stations that operate in conjunction with U.S. satellite systems under Part 25 of the FCC's rules.[28] As explained above and in the Council's Petition, a key element leading to the adoption of Section 25.255 was the universally accepted necessity to protect GPS receivers from harmful interference.

Carried to its illogical extreme, LightSquared's position that end user receivers operating in allocated services are not protected from harmful interference would allow a secondary or unprotected service provider to interfere with wireless, broadcast or satellite reception simply because the device actually receiving the interference -- a TV receiver or DBS antenna, for example -- is an unlicensed Part 15 device. In fact, Section 25.255 is just one of several FCC Rules that are designed specifically, in whole or in part, to protect unlicensed consumer receivers from overload.[29] In some cases, adjacent band receivers are protected from interference *even from primary services operating entirely in accordance with the allocation table and FCC rules.*

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[27] The provision of "radio service" includes both the transmission and reception of signals. *See, e.g., New Jersey Coalition for Fair Broadcasting v. FCC*, 574 F.2d 1119, 1124 (3d Cir. 1978) and cases cited therein.

[28] While GPS receivers may incidentally emit RF energy and are therefore regulated under Part 15 of the FCC's rules, the Commission's Part 15 regulations are designed to ensure that **transmissions** from such devices occur on a secondary basis. Part 15 is not intended to regulate device receiver characteristics. There has been no suggestion that any incidental transmissions from GPS devices are causing harmful interference to other services.

[29] *See, e.g.,* 47 C.F.R. § 73.318 & § 22.353 with respect to "blanketing interference." Blanketing interference is defined as "[d]isturbance ***in consumer receivers*** located in the immediate vicinity of a transmitter, caused by currents directly induced into the consumer receiver's circuitry by the relatively high field strength of the transmitter." 47 C.F.R. § 22.99 (emphasis added). "Overload interference, like blanketing interference, occurs when a receiver is near a relatively high-powered adjacent band transmitter and the high power from the transmitter overloads the components of the receiver and prevents reception of the desired signal." *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band and Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, 25 FCC Rcd 11710, 11719 n.56 (2010). Although the blanketing interference rules do not apply to mobile devices, they illustrate the Commission's determination that end user receivers operating in allocated services must be protected from harmful interference, as well as the Commission's placement of the burden for resolving such interference issues on the interfering party, even when that party is a primary service provider operating in full compliance with all FCC rules and the Table of Allocations.

LightSquared is therefore quite wrong in asserting that unlicensed receivers operating within a primary service lack protection from harmful interference.

III. Conclusion

The Council respectfully requests that the Commission rescind the language contained in paragraph 28 of its *2 GHz MSS R&O*. As demonstrated in its Petition and buttressed herein, no basis exists for the Commission to assert that extensive terrestrial L-band operations have been anticipated for many years or to maintain that primary L-band space-based services must use receivers that discriminate against reception of high power signals from adjacent-band MSS ATC, which has no spectrum allocation and must operate on a non-protected, non-harmful-interference basis. The Commission's statements in the MSS ATC proceeding show conclusively that ubiquitous deployment of stand-alone "MSS ATC" handsets offering high power, high density, high capacity terrestrial service was considered unthinkable in 2005, two years after LightSquared argues that the GPS community was "on notice" that it was inevitable, and continued to be inconceivable for many years thereafter. Thus the FCC's statements in the *2 GHz R&O* were inconsistent with the FCC's well-established precedent on this issue. Accordingly, the Commission should revise its decision on reconsideration to remove these incorrect statements.

Respectfully submitted,

THE U.S. GPS INDUSTRY COUNCIL

By: *Raul R. Rodriguez*

Raul R. Rodriguez
Stephen D. Baruch
David S. Keir

Lerman Senter PLLC
2000 K Street, NW, Suite 600
Washington, DC 20006
(202) 429-8970

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Its Attorneys

CERTIFICATE OF SERVICE

I, Sharon Krantzman, hereby certify that a true and correct copy of the foregoing "Consolidated Reply to Oppositions" filed by the U.S. GPS Industry Council was sent by first-class, postage prepaid mail this 6th day of September, 2011, to the following:

Jeffrey J. Carlisle
LightSquared Subsidiary LLC
10802 Parkridge Boulevard
Reston, VA 20191-4334

Lawrence R. Krevor
Richard B. Engelman
Trey Hanbury
Sprint Nextel Corporation
Suite 700
900 7th Street, NW
Washington, DC 20001

Christopher Guttman-McCabe
Brian M. Josef
Scott K. Bergmann
Michael F. Altschul
CTIA-The Wireless Association
Suite 600
1400 16th Street, NW
Washington, DC 20036

/s/ Sharon Krantzman
Sharon Krantzman